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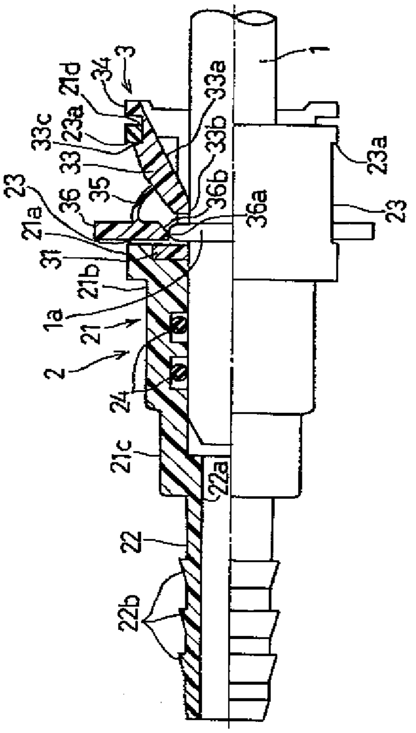
(54)【発明の名称】　コネクタ及びリテーナ

(57)【要約】

【課題】雄部材と雌部材とを連結する際に確認部材が外れ落ちてしまうことを防止しつつ、雄部材と雌部材との連結を確認する。

【解決手段】リテーナ３は、リテーナ３に一体的に形成された弾性変形可能な腕部３５と、腕部３５の先端に一体的に形成されるとともに、雌部材２と雄部材１との連結時における雄部材１のリング状突部１ａと軸方向に一致する位置で半径方向に延設して窓部２３に挿通された棒状部３６とを備えている。雌部材２及び雄部材１を連結した際、リング状突部１ａが棒状部３６の先端部３６ａに当接して棒状部３６が窓部２３を介してハウジング２１から半径方向外方に押し出される。これにより、雄部材１と雌部材２との連結を視覚的に、また触覚的に確認することができる。



【特許請求の範囲】

【請求項１】　先端から所定の距離隔てた位置に遠心方向に突出するリング状突部が設けられた挿入端部をもつ筒状の雄部材と、

上記挿入端部が挿入される軸方向に延びる軸穴を有するハウジングを軸方向一端に具備し、該ハウジングは、該軸穴を形成する周壁に、半径方向に貫通し周方向に互いに間隔を隔てて配設された複数の窓部を備えた筒状の雌部材と、

半径方向に弾性変形可能で上記窓部の一端側部分で半径方向外方への変位が許容されるように配設された複数の爪部を備え、各該爪部は、上記雄部材の挿入時に上記リング状突部が押圧摺接してスナップ入りできるように軸方向他端に向かうにつれて半径方向内方に傾斜した傾斜内面、上記リング状突部がスナップ入りして上記雄部材と上記雌部材とが連結された際に上記リング状突部と係合する係合端、及び流体圧が作用した際に上記雄部材が上記雌部材から外れないように上記窓部の一端面と係止する係止部をそれぞれ有し、上記ハウジング内に挿入保持されたリテーナとからなるコネクタにおいて、

上記リテーナは、該リテーナに一体的に形成された弾性変形可能な腕部と、該腕部の先端に一体的に形成されるとともに、上記雌部材と上記雄部材との連結時における該雄部材の上記リング状突部と軸方向に一致する位置で半径方向に延設して上記窓部の他端側部分に挿通された棒状部とをさらに備え、

上記雌部材及び上記雄部材を連結した際、上記リング状突部が上記棒状部の先端部に当接して該棒状部を上記窓部を介して上記ハウジングから半径方向外方に押し出すようになしたことを特徴とするコネクタ。

【請求項２】　先端から所定の距離隔てた位置に遠心方向に突出するリング状突部が設けられた挿入端部をもつ筒状の雄部材と、該挿入端部が挿入される軸方向に延びる軸穴及び該軸穴を形成する周壁に半径方向に貫通し周方向に互いに間隔を隔てて配設された複数の窓部を有するハウジングを軸方向一端に具備する筒状の雌部材とを連結するために、該ハウジング内に挿入保持されるリテーナであって、

上記リテーナは、半径方向に弾性変形可能で上記窓部の一端側部分で半径方向外方への変位が許容されるように配設される複数の爪部を備え、各該爪部は、上記雄部材の挿入時に上記リング状突部が押圧摺接してスナップ入りできるように軸方向他端に向かうにつれて半径方向内方に傾斜した傾斜内面、上記リング状突部がスナップ入りして上記雄部材と上記雌部材とが連結された際に上記リング状突部と係合する係合端、及び流体圧が作用した際に上記雄部材が上記雌部材から外れないように上記窓部の一端面と係止する係止部をそれぞれ有し、かつ、

上記リテーナは、該リテーナに一体的に形成された弾性変形可能な腕部と、該腕部の先端に一体的に形成されるとともに、上記雌部材と上記雄部材との連結時における該雄部材の上記リング状突部と軸方向に一致する位置で半径方向に延設して上記窓部の他端側部分に挿通される棒状部とを備え、

上記雌部材及び上記雄部材を連結した際、上記リング状突部が上記棒状部の先端部に当接することにより、該棒状部が上記窓部を介して上記ハウジングから半径方向外方に押し出されるようになされていることを特徴とするリテーナ。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、ホースやパイプなどを配管のために連結するコネクタ、及びこのコネクタに用いられるリテーナに関し、より詳しくは雄部材と雌部材との連結状態を確認することのできるコネクタ及びリテーナに関する。

【０００２】

【従来の技術】ホースなどを連結するコネクタとして、図５及び図６に示すものが知られている。このコネクタは、先端から所定の距離隔てた位置に遠心方向に突出するリング状突部８０ａが設けられたパイプ状の雄部材８０と、雄部材８０が挿入される挿入開口端８１ａをもつ略円筒状のハウジング８１を有する雌部材８２と、ハウジング８１の挿入開口端８１ａ側の端部に挿入保持され、ハウジング８１内に挿入された雄部材８０を雌部材８２に連結させるためのリテーナ８３と、ハウジング８１の外周面に軸直角方向から外装保持され、雌部材８２に雄部材８１が連結されたことを確認するための確認部材８４とから構成されている。

【０００３】上記ハウジング８１の挿入開口端８１ａ側の端部には半径方向に貫通し周方向に対向配設された一対の窓部８１ｂが設けられ、上記リテーナ８３は半径方向に弾性変形可能で該窓部８１ｂと対応する位置に配設されたされた一対の爪部８３ａを有している。また、上記確認部材８４は、図６に示すように、弾性変形により拡径可能な略Ｃ字形状をなし、上記ハウジング８１の上記窓部８１ｂの端部に連続的に設けられた切欠溝８１ｃ内に挿入されて、ハウジング８１の外周面に軸直角方向から外装保持されている。そして、この確認部材８４は、上記雄部材８０が上記雌部材８２に連結される前の状態で上記窓部８１ｂの端縁と係止して上記ハウジング８１から確認部材８４が軸直角方向に外れることを規制する一対の係止凹部８４ａ、上記雄部材８０の挿入時に上記リング状突部８０ａの外周面が当接する一対の先端当接部８４ｂを有している。

【０００４】このコネクタでは、雄部材８０を雌部材８２に連結させる前の状態において、確認部材８４がハウジング８１の外周面に軸直角方向から外装保持され、確認部材８４の係止凹部８４ａがハウジング８１の窓部８１ｂの端縁に係止されるとともに、確認部材８４の先端

当接部８４ｂが窓部８１ｂ内で上記リテーナ８３の爪部８３ａよりも軸方向奥側の位置に挿入されている。この状態で、雄部材８０を雌部材８２のハウジング８１内に挿入すると、雄部材８０のリング状突部８０ａは、リテーナ８３の爪部８３ａをその弾性に抗して半径方向外方に押し拡げ、爪部８３ａを通過する。これにより、爪部８３ａの先端とリング状突部８０ａとが係止して、雄部材８０と雌部材８２とは連結状態とされる。この連結状態（図５及び図６の状態）では、雄部材８０のリング状突部８０ａは、確認部材８４の先端当接部８４ｂを半径方向外方に押し拡げる。すると、確認部材８４の先端当接部８４ｂは窓部８１ｂの端縁から外れ、確認部材８４は軸直角方向（図６の矢印方向）にその弾性により飛び出て外れる。これにより、雄部材８０が雌部材８２に連結されたことを確認することができる。

【０００５】

【発明が解決しようとする課題】上述のように従来のコネクタは、雄部材８０が雌部材８２に連結された時に、確認部材８４がその弾性復帰力によりハウジング８１から軸直角方向に外れることで、雄部材８０が雌部材８２に連結されたことを確認するものである。なお、上記従来のコネクタでは、確認部材８４をハウジング８１から軸直角方向に外れ易くするために、ハウジング８１に切欠溝８１ｃを設けて確認部材８４が跨るハウジング８１の側壁の周方向幅を狭くしたり、あるいは確認部材８４の先端当接部８４の内面側に中間部材を別途配設し、この中間部材を介してリング状突部８０ａにより確認部材８４の先端当接部８４ｂを半径方向外方に押し拡げたりする工夫がなされている。

【０００６】しかし、雄部材８０が雌部材８２に連結されたと同時に、確認部材８４がその弾性復帰力によりハウジング８１から外れて飛び出てしまうと、連結後にハウジング８１から外れ落ちた確認部材８４を拾い集める必要があり、コネクタを適用する箇所によってはそれが極めて困難となる場合がある。また、確認部材８４が外れ落ちては困るような箇所には、上記従来のコネクタを適用することができない。

【０００７】本発明は上記実情に鑑みてなされたものであり、雄部材と雌部材とを連結する際に確認部材が外れ落ちてしまうことを防止しつつ、雄部材と雌部材との連結を確認することのできるコネクタ及びリテーナを提供することを解決すべき技術課題とするものである。

【０００８】

【課題を解決するための手段】上記課題を解決する本発明のコネクタは、先端から所定の距離隔てた位置に遠心方向に突出するリング状突部が設けられた挿入端部をもつ筒状の雄部材と、上記挿入端部が挿入される軸方向に延びる軸穴を有するハウジングを軸方向一端に具備し、該ハウジングは、該軸穴を形成する周壁に、半径方向に貫通し周方向に互いに間隔を隔てて配設された複数の窓部を備えた筒状の雌部材と、半径方向に弾性変形可能で上記窓部の一端側部分で半径方向外方への変位が許容されるように配設された複数の爪部を備え、各該爪部は、上記雄部材の挿入時に上記リング状突部が押圧摺接してスナップ入りできるように軸方向他端に向かうにつれて半径方向内方に傾斜した傾斜内面、上記リング状突部がスナップ入りして上記雄部材と上記雌部材とが連結された際に上記リング状突部と係合する係合端、及び流体圧が作用した際に上記雄部材が上記雌部材から外れないように上記窓部の一端面と係止する係止部をそれぞれ有し、上記ハウジング内に挿入保持されたリテーナとからなるコネクタにおいて、上記リテーナは、該リテーナに一体的に形成された弾性変形可能な腕部と、該腕部の先端に一体的に形成されるとともに、上記雌部材と上記雄部材との連結時における該雄部材の上記リング状突部と軸方向に一致する位置で半径方向に延設して上記窓部の他端側部分に挿通された棒状部とをさらに備え、上記雌部材及び上記雄部材を連結した際、上記リング状突部が上記棒状部の先端部に当接して該棒状部を上記窓部を介して上記ハウジングから半径方向外方に押し出すようになしたことを特徴とするものである。

【０００９】上記課題を解決する本発明のリテーナは、先端から所定の距離隔てた位置に遠心方向に突出するリング状突部が設けられた挿入端部をもつ筒状の雄部材と、該挿入端部が挿入される軸方向に延びる軸穴及び該軸穴を形成する周壁に半径方向に貫通し周方向に互いに間隔を隔てて配設された複数の窓部を有するハウジングを軸方向一端に具備する筒状の雌部材とを連結するために、該ハウジング内に挿入保持されるリテーナであって、上記リテーナは、半径方向に弾性変形可能で上記窓部の一端側部分で半径方向外方への変位が許容されるように配設される複数の爪部を備え、各該爪部は、上記雄部材の挿入時に上記リング状突部が押圧摺接してスナップ入りできるように軸方向他端に向かうにつれて半径方向内方に傾斜した傾斜内面、上記リング状突部がスナップ入りして上記雄部材と上記雌部材とが連結された際に上記リング状突部と係合する係合端、及び流体圧が作用した際に上記雄部材が上記雌部材から外れないように上記窓部の一端面と係止する係止部をそれぞれ有し、かつ、上記リテーナは、該リテーナに一体的に形成された弾性変形可能な腕部と、該腕部の先端に一体的に形成されるとともに、上記雌部材と上記雄部材との連結時における該雄部材の上記リング状突部と軸方向に一致する位置で半径方向に延設して上記窓部の他端側部分に挿通される棒状部とを備え、上記雌部材及び上記雄部材を連結した際、上記リング状突部が上記棒状部の先端部に当接することにより、該棒状部が上記窓部を介して上記ハウジングから半径方向外方に押し出されるようになされていることを特徴とするものである。

【００１０】なお、本明細書において、軸方向とは雌部

材の軸方向（及びこれに対応する方向）を意味し、周方向とは雌部材の周方向（及びこれに対応する方向）を意味する。本発明のコネクタ及びリテーナでは、雄部材を雌部材に連結させる前の状態において、リテーナが雌部材の軸方向一端側からハウジング内に挿入されて、保持されている。このとき、リテーナの各爪部は上記窓部の一端側部分で半径方向外方への変位が許容されるように配設されており、またリテーナの棒状部は雄部材と雌部材との連結時における該雄部材のリング状突部と軸方向に一致する位置で半径方向に延設してハウジングの窓部の他端側部分に挿通されている。またこの状態で、リテーナの棒状部の先端部は、雄部材の挿入時におけるリング状突部の軌跡内に位置している。

【００１１】そして、雄部材の挿入端部を雌部材の軸方向一端から軸穴内に挿入すると、雄部材のリング状突部は、リテーナの爪部の傾斜内面を押圧摺接することにより、爪部をその弾性に抗して半径方向外方に押し拡げ、爪部を通過する。これにより、爪部は半径方向内方に弾性復帰し、爪部の係合端とリング状突部とが係合して、雄部材と雌部材とはリテーナを介して連結状態とされる。なお、この状態で雌部材及び雄部材内を流体が流通して流体圧が作用した場合、リテーナの爪部の係止部が窓部の一端面に係止することにより、雄部材が雌部材から軸方向に外れることが確実に規制される。

【００１２】この雄部材の挿入完了時（雄部材と雌部材との連結時）においては、雄部材のリング状突部の軌跡内に位置していた上記棒状部の先端部が該リング状突部により押圧され、リテーナの腕部の弾性変形を介して半径方向外方に移動し、該棒状部がハウジングの窓部の他端側部分を介してハウジングから半径方向外方に押し出される。このようにリテーナの棒状部がハウジングから半径方向外方に押し出されることにより、雄部材と雌部材との連結を視覚的に、また触覚的に確認することができる。このため、棒状部がハウジングから半径方向外方に押し出されたことについて、視覚的に確認し難いような場合であっても、手指等により触覚的に確認することが可能となる。

【００１３】そして、本発明のコネクタ及びリテーナは、雄部材を雌部材に連結させた後に確認部材として機能する棒状部がハウジングから飛び出て外れるようなことがない。このため、連結後にハウジングから外れ落ちた確認部材を拾い集める作業が不要となる。

【００１４】

【発明の実施の形態】以下、本発明の実施の形態を図面を参照しつつ具体的に説明する。

（実施形態１）図１～図４に示す本実施形態のコネクタは、筒状の雄部材１と、図示しないホース（ゴムあるいは樹脂チューブ等のホース）の一端が固定される略円筒状の雌部材２と、雌部材３に内装され、雌部材２内に挿入された雄部材１を雌部材２に連結させるためのリテーナ３とから構成されている。

【００１５】雄部材１は、金属製又は樹脂製のパイプよりなり、図４に示すように、先端から所定の距離隔てた位置に遠心方向に突出するように設けられたリング状突部１ａと、このリング状突部１ａより先端側に位置する先端部１ｂとを備えた挿入端部１ｃを有している。雌部材２は、樹脂（ナイロン）製で、図１及び図２に示すように、軸方向一端側（図１及び図２の右側、以下同様）に設けられたハウジング２１と、軸方向他端側（図１及び図２の左側、以下同様）にハウジング２１と同軸的に設けられたホース接続端部２２とから構成されている。そして、ハウジング２１は、軸方向一端側から順に同軸状に設けられた大径部２１ａ、中径部２１ｂ及び小径部２１ｃよりなり、上記雄部材１の上記挿入端部１ｃが挿入される挿入開口端２１ｄを軸方向一端側の端部に有している。また、ハウジング２１及びホース接続端部２２は内周面に軸穴２２ａを有し、ホース接続端部２２の外周面にはホースの抜けを規制するための３つの段部２２ｂ，２２ｂ，２２ｂが設けられている。

【００１６】上記大径部２１ａには、ハウジング２１の軸穴２２ａを形成する周壁に、半径方向に貫通する一対の窓部２３，２３が周方向に等間隔を隔てて対向して設けられている。また、上記中径部２１ｂの内周面には、上記ハウジング２１に挿入された上記挿入端部１ｃの上記先端部１ｂの外周面をシールするリング状のシール部材２４，２４が２個格納されている。上記小径部２１ｃの内周面は上記ハウジング２１に挿入された上記挿入端部１ｃの上記先端部１ｂの外周面と嵌合するリング状の嵌合内周面とされている。

【００１７】上記リテーナ３は、弾性変形可能な樹脂（ナイロン）製部材よりなり、上記ハウジング２１の大径部２１ａ内に挿入保持されている。リテーナ３は、図４に示すように、環状カラー部３１と、この環状カラー部３１から相対向するようにそれぞれ突出する一対の略コ字状部３２、３２と、各略コ字状部３２、３２からそれぞれ軸芯に対して半径方向内方に傾斜するように突出し、半径方向に弾性変形可能で上記窓部２３，２３の一端側部分で半径方向外方への変位が許容されるように配設される一対の爪部３３、３３と、略コ字状部３２，３２の先端から半径方向外方に延出するフランジ部３４，３４とを備えている。そして、各爪部３３，３３は、雄部材１の挿入時にリング状突部１ａが押圧摺接してスナップ入りできるように軸方向他端に向かうにつれて半径方向内方に傾斜した傾斜内面３３ａ，３３ａと、リング状突部１ａがスナップ入りして雄部材１と雌部材２とが連結された際にリング状突部１ａと係合する係合端３３ｂ，３３ｂと、流体圧が作用した際に雄部材１が雌部材２から外れないように窓部２３，２３の一端面２３ａ，２３ａと係止する係止部としての係止段部３３ｃ，３３ｃとをそれぞれ有している。

【００１８】また、リテーナ３は、各爪部３３、３３の外面に一体的に形成された弾性変形可能な一対の腕部３５，３５と、各腕部３５，３５の先端に一体的に形成されるとともに、雌部材２と雄部材１との連結時における雄部材１のリング状突部１ａと軸方向に一致する位置で半径方向に延設して各窓部２３，２３の他端側部分に挿通された一対の棒状部３６，３６とを備えている。各棒状部３６，３６の先端部３６ａ，３６ａの軸方向一端側の端部は、ハウジング２１内に挿入される雄部材１のリング状突部１ａとの摺接により棒状部３６，３６が半径方向外方に押し出され易いように、傾斜面３６ｂ，３６ｂとされている。なお、リテーナ３は、ハウジング２１内への挿入のし易さを考慮して、ハウジング２１に対して軸方向に相対移動可能に保持されている。

【００１９】本実施形態のコネクタでは、雄部材１を雌部材２に連結させる前の状態において、リテーナ３が雌部材２の軸方向一端側からハウジング２１内に挿入されて、保持されている。このとき、リテーナ３の各爪部３３，３３はハウジング２１の各窓部２３，２３の一端側部分で半径方向外方への変位が許容されるように配設されており、またリテーナ３３の棒状部３６，３６は雄部材１と雌部材２との連結時における雄部材１のリング状突部１ａと軸方向に一致する位置で半径方向に延設してハウジング２１の窓部２３，２３の他端側部分に挿通されている。またこの状態で、リテーナ３の棒状部３６，３６の先端部３６ａ，３６ａは、雄部材１の挿入時におけるリング状突部１ａの軌跡内に位置している。

【００２０】そして、雄部材１の挿入端部１ｃを雌部材２の軸方向一端から軸穴２２ａ内に挿入すると、雄部材１のリング状突部１ａは、リテーナ３の各爪部３３，３３の傾斜内面３３ａ，３３ａを押圧摺接することにより、爪部３３，３３をその弾性に抗して半径方向外方に押し拡げ、爪部３３，３３を通過する。これにより、爪部３３，３３は半径方向内方に弾性復帰し、爪部３３，３３の係合端３３ｂ，３３ｂとリング状突部１ａとが係止して、雄部材１と雌部材２とはリテーナ３を介して連結状態とされる。なお、この状態で雌部材１及び雄部材２内を流体が流通して流体圧が作用した場合、リテーナ３の爪部３３，３３の係止段部３３ｃ，３３ｃが窓部２３，２３の一端面２３ａ，２３ａに係止することにより、雄部材１及びリテーナ３が雌部材２から軸方向に外れることが確実に規制される。

【００２１】この雄部材１の挿入完了時（雄部材１と雌部材２との連結時）においては、雄部材１のリング状突部１ａの軌跡内に位置していた上記各棒状部３６，３６の先端部３６ａ，３６ａが該リング状突部１ａにより押圧され、リテーナ３の腕部３５，３５の弾性変形を介して半径方向外方に移動し、該棒状部３６，３６がハウジング２１の窓部２３，２３の他端側部分を介してハウジング２１から半径方向外方に押し出される（図２参照）。このようにリテーナ３の棒状部３６，３６がハウジング２１から半径方向外方に押し出されることにより、雄部材１と雌部材２との連結を視覚的に、また触覚的に確認することができる。このため、棒状部３６，３６がハウジング２１から半径方向外方に押し出されたことについて、視覚的に確認し難いような場合であっても、手指等により触覚的に確認することが可能となる。

【００２２】そして、本実施形態のコネクタでは、雄部材１を雌部材２に連結させた後に確認部材として機能する棒状部３６，３６がハウジングから飛び出て外れるようなことがない。このため、連結後にハウジング２１から外れ落ちた確認部材を拾い集める作業が不要となる。したがって、本実施形態のコネクタは、確認部材が外れ落ちては困るような箇所や外れ落ちた確認部材を拾い集めるのが困難な箇所等にも適用することが可能となる。

【００２３】なお、上記実施形態では、リテーナ３において、腕部３５及び棒状部３６を爪部３３の外面に一体的に形成する例について説明したが、特にこの構成に限定されるものではない。例えば、腕部３５をリテーナ３の環状カラー部３１に一体的に形成し、この腕部３５の先端部に棒状部３６を一体的に形成することも可能である。腕部３５及び棒状部３６の数についても、それぞれ１個ずつとすることもできる。

【００２４】

【発明の効果】以上詳述したように本発明のコネクタ及びリテーナにおいては、雄部材と雌部材とが連結されると、確認部材として機能する棒状部がハウジングから半径方向外方に押し出されるため、雄部材と雌部材との連結を視覚的に、また触覚的に確認することができる。このため、棒状部がハウジングから半径方向外方に押し出されたことについて、視覚的に確認し難いような場合であっても、手指等により触覚的に確認することが可能となる。

【００２５】また、雄部材を雌部材に連結させた後に確認部材として機能する棒状部がハウジングから飛び出て外れるようなことがないため、連結後にハウジングから外れ落ちた確認部材を拾い集める作業が不要となる。したがって、本発明のコネクタ及びリテーナは、確認部材が外れ落ちては困るような箇所や外れ落ちた確認部材を拾い集めるのが困難な箇所等にも適用することが可能となる。

【図面の簡単な説明】

【図１】実施形態のコネクタに係り、雄部材を雌部材に挿入する前の雌部材及びリテーナを示す断面図である。

【図２】実施形態のコネクタに係り、雄部材の挿入完了時を示す断面図である。

【図３】実施形態のコネクタに係り、リテーナの斜視図である。

【図４】実施形態のコネクタに係り、雄部材の側面図である。

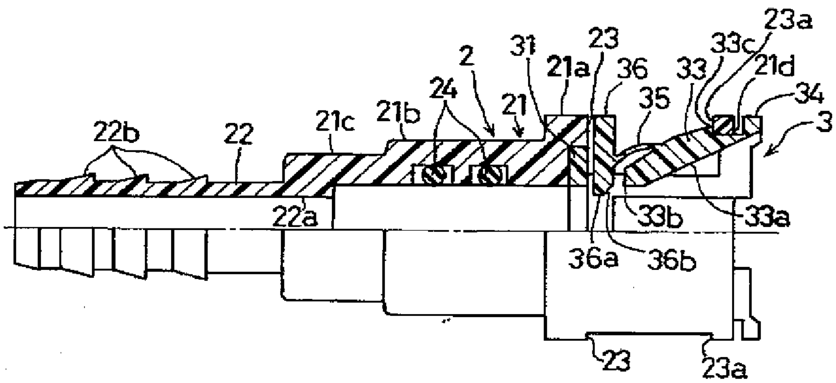
【図５】従来のコネクタに係り、雄部材の挿入完了時を示す断面図である。

【図６】従来のコネクタに係り、図５のＥ－Ｅ線矢視断面図である。

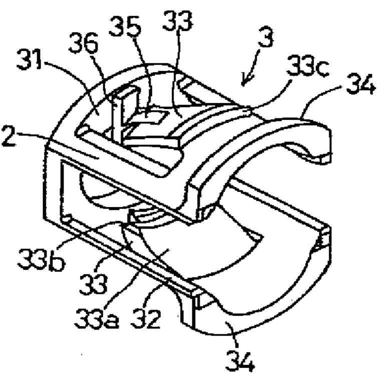
【符号の説明】

＊１：雄部材、１ａ：リング状突部、１ｃ：挿入端部、２：雌部材、２１：ハウジング、２３：窓部、３：リテーナ、３３：爪部、３３ａ：傾斜内面、３３ｂ：係止端部、３３ｃ：係止部としての係止段部　＊３５：腕部、３６：棒状部

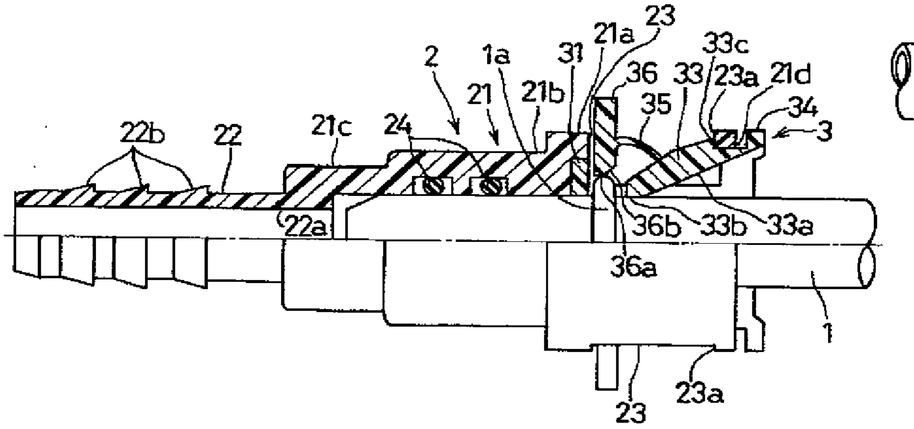
【図１】



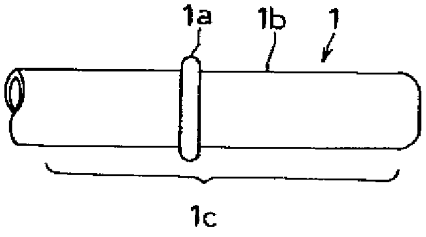
【図３】



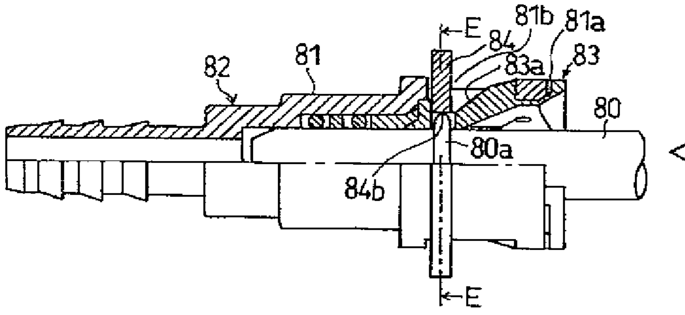
【図２】



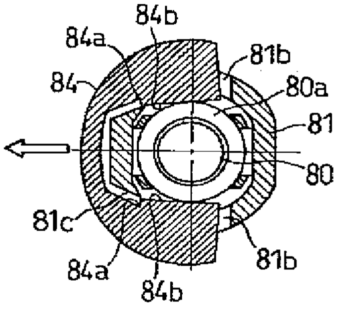
【図４】



【図５】



【図６】



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(72)Inventor : KAWASAKI MINORU
NAGAE KATSUAKI

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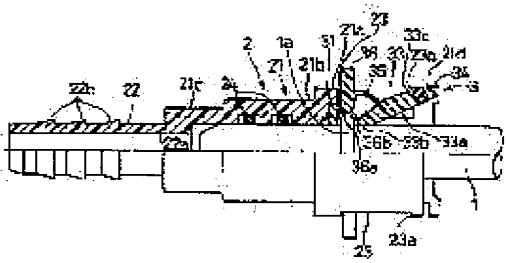
(54) CONNECTOR AND RETAINER

(57)Abstract:
PROBLEM TO BE SOLVED: To check connection of a male member to a female member while preventing a checking member from being detached and dropped in connecting the male member to the female member.
SOLUTION: A retainer 3 is provided with an elastically deformable arm part 35 which is integrated with the retainer 3, and a rod-shaped part 36 which is integrated with a tip of the arm part 35, extended in the radial direction at the position to be agreed in the axial direction with a ring-shaped projected part 1a of a male member 1 when a female member 2 is connected to the male member 1, and inserted in a window part 23. When the female member 2 is connected to the male member 1, the ring-shaped projected part 1a is abutted on a tip part 36a of the rod-shaped part 36, and the rod-shaped part 36 is pressed outwardly in the radial direction from a housing 21 through the window part 23. Connection of the male member to the female member 2 can be visually and tactually checked.



LEGAL STATUS

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[Date of registration]	
[Number of appeal against examiner's decision of rejection]	

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]
[Claim 1] Tubed male part material with the insertion edge where the ring-like projected part which projects in the centrifugal direction was prepared in predetermined distance partition ****** from the tip, Housing which has the axial hole prolonged in the shaft orientations in which the above-mentioned insertion edge is inserted is provided at the shaft-orientations end. This housing The tubed female member equipped with two or more window parts which penetrated to radial and were arranged in the hoop direction by separating spacing mutually by the peripheral wall which forms this axial hole, Elastic deformation is possible to radial and it has two or more claw parts arranged so that the variation rate to the method of the outside of radial might be permitted by part for the end flank of the above-mentioned window part. Each ****** The inclination inside which inclined in the method of the inside of radial as it went to the shaft-orientations other end so that the above-mentioned ring-like projected part might carry out a press slide contact and it could carry out entering a snap of it at the time of insertion of the above-mentioned male part material, The engagement edge which engages with the above-mentioned ring-like projected part when the above-mentioned ring-like projected part enters a snap and the above-mentioned male part material and the above-mentioned female member are connected, And when hydrostatic pressure acts, have the end side of the above-mentioned window part, and the stop section to stop, respectively so that the above-mentioned male part material may not separate from the above-mentioned female member, and it sets to the connector which consists of a retainer by which insertion maintenance was carried out into the above-mentioned housing. While the above-mentioned retainer is formed at the tip of the arm which was formed in this retainer in one and in which elastic deformation is possible, and this arm in one It has further the cylindrical section which installed in radial in the location which is in agreement with the above-mentioned ring-like projected part and shaft orientations of this male part material at the time of connection to the above-mentioned female member and the above-mentioned male part material, and was inserted in a part for the other end flank of the above-mentioned window part. The connector characterized by making as [extrude / this cylindrical section / in contact with the point of the above-mentioned cylindrical section / the above-mentioned ring-like projected part / to the method of the outside of radial / from the above-mentioned housing / through the above-mentioned window part] when the above-mentioned female member and the above-mentioned male part material are connected.
[Claim 2] Tubed male part material with the insertion edge where the ring-like projected part which projects in the centrifugal direction was prepared in predetermined distance partition ****** from the tip, In order to connect the tubed female member which possesses housing which has two or more window parts which penetrated to radial at the peripheral wall which forms the axial hole and this axial hole which are prolonged in the shaft orientations in which this insertion edge is inserted, and were arranged in the hoop direction by separating spacing mutually at the shaft-orientations end It is the retainer by which insertion maintenance is carried out into this housing. The above-mentioned retainer Elastic deformation is possible to radial and it has two or more claw parts arranged so that the variation rate to the method of the outside of radial may be permitted by part for the end flank of the above-mentioned window part. Each ****** The inclination inside which inclined in the method of the inside of radial as it went to

the shaft-orientations other end so that the above-mentioned ring-like projected part might carry out a press slide contact and it could carry out entering a snap of it at the time of insertion of the above-mentioned male part material, The engagement edge which engages with the above-mentioned ring-like projected part when the above-mentioned ring-like projected part enters a snap and the above-mentioned male part material and the above-mentioned female member are connected, It has the end side of the above-mentioned window part, and the stop section to stop, respectively so that the above-mentioned male part material may not separate from the above-mentioned female member, when hydrostatic pressure acts. And and the above-mentioned retainer While being formed at the tip of the arm which was formed in this retainer in one and in which elastic deformation is possible, and this arm in one It has the cylindrical section which installs in radial in the location which is in agreement with the above-mentioned ring-like projected part and shaft orientations of this male part material at the time of connection to the above-mentioned female member and the above-mentioned male part material, and is inserted in a part for the other end flank of the above-mentioned window part. The retainer characterized by being made as [extrude / through the above-mentioned window part / this cylindrical section / when the above-mentioned female member and the above-mentioned male part material are connected, and the above-mentioned ring-like projected part contacts the point of the above-mentioned cylindrical section / from the above-mentioned housing / by the method of the outside of radial].

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the connector and retainer which can check the connection condition of male part material and a female member in more detail about the connector which connects a hose, a pipe, etc. for piping, and the retainer used for this connector.
[0002]
[Description of the Prior Art] As a connector which connects a hose etc., what is shown in drawing 5 and drawing 6 is known. The pipe-like male part material 80 by which ring-like projected part 80a which projects in the centrifugal direction was prepared in distance partition ****** predetermined [a tip to] in this connector, The female member 82 which has the approximately cylindrical housing 81 with insertion opening edge 81a in which the male part material 80 is inserted, The retainer 83 for making the male part material 80 which insertion maintenance was carried out at the edge by the side of insertion opening edge 81a of housing 81, and was inserted into housing 81 connect with the female member 82, Sheathing maintenance is carried out from an axial right angle at the peripheral face of housing 81, and it consists of check members 84 for checking that the male part material 81 has been connected with the female member 82.
[0003] In the edge by the side of insertion opening edge 81a of the above-mentioned housing 81, it penetrates to radial, and window part 81b of the pair by which opposite arrangement was carried out is prepared in a hoop direction, elastic deformation is possible for the above-mentioned retainer 83 to radial, and it has this window part 81b and claw part 83a of the pair which was arranged in the corresponding location and which was carried out. Moreover, as shown in drawing 6 , the above-mentioned check member 84 is inserted into notching slot 81c which was able to prepare continuously the shape of an abbreviation C typeface whose diameter can be expanded by elastic deformation in the edge of the above-mentioned window part 81b of nothing and the above-mentioned housing 81, and sheathing maintenance is carried out from the axial right angle at the peripheral face of housing 81. And it has stop crevice 84a of the pair which regulates that this check member 84 stops with the edge of the above-mentioned window part 81b in the condition before the above-mentioned male part material 80 is connected with the above-mentioned female member 82, and the check member 84 separates from it in the direction of an axial right angle from the above-mentioned housing 81, and tip contact section 84b of the pair to which the peripheral face of the above-mentioned ring-like projected part 80a contacts at the time of insertion of the above-mentioned male part material 80.
[0004] In the condition before making the male part material 80 connect with the female member 82 in this connector While sheathing maintenance of the check member 84 is carried out from an axial right angle at the peripheral face of housing 81 and stop crevice 84a of the check member 84 is stopped by the edge of window part 81b of housing 81 Tip contact section 84b of the check member 84 is inserted in the location by the side of the shaft-orientations back rather than claw part 83a of the above-mentioned retainer 83 within window part 81b. In this condition, if the male part material 80 is inserted into the housing 81 of the female member 82, ring-like projected part 80a of the male part material 80 will resist that elasticity, will extend claw part

83a of a retainer 83 to the method of the outside of radial, and will pass claw part 83a. Thereby, the tip of claw part 83a and ring-like projected part 80a stop, and the male part material 80 and the female member 82 are made into a connection condition. In the state of this connection (drawing 5 and condition of drawing 6), ring-like projected part 80a of the male part material 80 extends tip contact section 84b of the check member 84 to the method of the outside of radial. Then, it separates from tip contact section 84b of the check member 84 from the edge of window part 81b, and the check member 84 jumps out with the elasticity in the direction of an axial right angle (the direction of an arrow head of drawing 6), and separates in it. Thereby, it can be checked that the male part material 80 has been connected with the female member 82.

[0005]

[Problem(s) to be Solved by the Invention] As mentioned above, when the male part material 80 is connected with the female member 82, the conventional connector is that the check member 84 separates in the direction of an axial right angle from housing 81 according to the elastic return force, and checks that the male part material 80 has been connected with the female member 82. In addition, in the above-mentioned conventional connector, in order to make the check member 84 easy to separate in the direction of an axial right angle from housing 81 Narrow hoop direction width of face of the side attachment wall of the housing 81 with which notching slot 81c is prepared in housing 81, and the check member 84 straddles it, or Or pars intermedia material is separately arranged in the inside side of the tip contact section 84 of the check member 84, and the device which extends tip contact section 84b of the check member 84 to the method of the outside of radial by ring-like projected part 80a through this pars intermedia material is made.

[0006] However, if the check member 84 separates from housing 81 according to the elastic return force and jumps out at the same time the male part material 80 is connected with the female member 82, depending on the part which needs to gather and collect the check members 84 which separated and fell from housing 81, and applies a connector after connection, it may become very difficult. Moreover, the above-mentioned conventional connector is inapplicable to a part which is troubled if the check member 84 separates and it falls.

[0007] This invention is made in view of the above-mentioned actual condition, and let it be the technical technical problem which should be solved to offer the connector and retainer which can check connection to male part material and a female member, preventing a check member separating and falling, in case male part material and a female member are connected.

[0008]

[Means for Solving the Problem] The tubed male part material in which the connector of this invention which solves the above-mentioned technical problem has the insertion edge where the ring-like projected part which projects in the centrifugal direction was prepared in predetermined distance partition ****** from the tip, Housing which has the axial hole prolonged in the shaft orientations in which the above-mentioned insertion edge is inserted is provided at the shaft-orientations end. This housing The tubed female member equipped with two or more window parts which penetrated to radial and were arranged in the hoop direction by separating spacing mutually by the peripheral wall which forms this axial hole, Elastic deformation is possible to radial and it has two or more claw parts arranged so that the variation rate to the method of the outside of radial might be permitted by part for the end flank of the above-mentioned window part. Each ****** The inclination inside which inclined in the method of the inside of radial as it went to the shaft-orientations other end so that the above-mentioned ring-like projected part might carry out a press slide contact and it could carry out entering a snap of it at the time of insertion of the above-mentioned male part material, The engagement edge which engages with the above-mentioned ring-like projected part when the above-mentioned ring-like projected part enters a snap and the above-mentioned male part material and the above-mentioned female member are connected, And when hydrostatic pressure acts, have the end side of the above-mentioned window part, and the stop section to stop, respectively so that the above-mentioned male part material may not separate from the above-mentioned female member, and it sets to the connector which consists of a retainer by which insertion maintenance was carried out into the above-mentioned housing. While the above-mentioned retainer is formed at the tip of the arm which was formed in this retainer in one and in which elastic deformation is possible, and this arm in one It has further the cylindrical section which installed in radial in the location which is in agreement with the above-mentioned ring-like projected part and shaft orientations of this male part material at the time of connection to the above-mentioned female member and the above-mentioned male part material, and was inserted in a part for the other end flank of the above-mentioned window part. When the above-mentioned female member and the above-mentioned male part material are connected, it is characterized by making as [extrude / this cylindrical section / in contact with the point of the above-mentioned cylindrical section / the above-mentioned ring-like projected part / to the method of the outside of radial / from the above-mentioned housing / through the above-mentioned window part].

[0009] The tubed male part material in which the retainer of this invention which solves the above-mentioned technical problem has the insertion edge where the ring-like projected part which projects in the centrifugal direction was prepared in predetermined distance partition ****** from the tip, In order to connect the tubed female member which possesses housing which has two or more window parts which penetrated to radial at the peripheral wall which forms the axial hole and this axial hole which are prolonged in the shaft orientations in which this insertion edge is inserted, and were arranged in the hoop direction by separating spacing mutually at the shaft-orientations end It is the retainer by which insertion maintenance is carried out into this housing. The above-mentioned retainer Elastic deformation is possible to radial and it has two or more claw parts arranged so that the variation rate to the method of the outside of radial may be permitted by part for the end flank of the above-mentioned window part. Each ****** The inclination inside which inclined in the method of the inside of radial as it went to the shaft-orientations other end so that the above-mentioned ring-like projected part might carry out a press slide contact and it could carry out entering a snap of it at the time of insertion of the above-mentioned male part material, The engagement edge which engages with the above-mentioned ring-like projected part when the above-mentioned ring-like projected part enters a snap and the above-mentioned male part material and the above-mentioned female member are connected, It has the end side of the above-mentioned window part, and the stop section to stop, respectively so that the above-mentioned male part material may not separate from the above-mentioned female member, when hydrostatic pressure acts. And and the above-mentioned retainer While being formed at the tip of the arm which was formed in this retainer in one and in which elastic deformation is possible, and this arm in one It has the cylindrical section which installs in radial in the location which is in agreement with the above-mentioned ring-like projected part and shaft orientations of this male part material at the time of connection to the above-mentioned female member and the above-mentioned male part material, and is inserted in a part for the other end flank of the above-mentioned window part. When the above-mentioned female member and the above-mentioned male part material are connected, and the above-mentioned ring-like projected part contacts the point of the above-mentioned cylindrical section, it is characterized by being made as [extrude / through the above-mentioned window part / this cylindrical section / from the above-mentioned housing / by the method of the outside of radial].

[0010] In addition, in this specification, shaft orientations mean the shaft orientations (and direction corresponding to this) of a female member, and a hoop direction means the hoop direction (and direction corresponding to this) of a female member. In the connector and retainer of this invention, in the condition before making male part material connect with a female member, a retainer is inserted into housing and held from the shaft-orientations end side of a female member. At this time, each claw part of a retainer is arranged so that the variation rate to the method of the outside of radial may be permitted by part for the end flank of the above-mentioned window part, and the cylindrical section of a retainer is installed in radial in the location which is in agreement with the ring-like projected part and shaft orientations of this male part material at the time of connection to male part material and a female member, and is inserted in a part for the other end flank of the window part of housing. Moreover, in this condition, the point of the cylindrical section of a retainer is located in the locus of the ring-like projected part at the time of insertion of male part material.

[0011] And if the insertion edge of male part material is inserted into an axial hole from the shaft-orientations end of a female member, by carrying out the press slide contact of the inclination inside of the claw part of a retainer, the ring-like projected part of male part material will resist the elasticity, will extend a claw part to the method of the outside of radial, and will pass a claw part. Thereby, a claw part carries out an elastic return at the method of the inside of radial, the engagement edge and ring-like projected part of a claw part are engaged, and male part material and a female member are made into a connection condition through a retainer. In addition, when a fluid circulates the inside of female member and male part material in this condition, hydrostatic pressure acts, and the stop section of the claw part of a retainer stops to the end side of a window part, it is regulated certainly that male part material separates in shaft orientations from a female member.

[0012] The point of the above-mentioned cylindrical section located in the locus of the ring-like projected part of male part material at the time of the completion of insertion of this male part material (at the time of connection to male part material and a female member) is pressed by this ring-like projected part, it moves to the method of the outside of radial through the elastic deformation of the arm of a retainer, and this cylindrical section is extruded from housing through a part for the other end flank of the window part of housing by the method of the outside of radial. Thus, when the cylindrical section of a retainer is extruded from housing by the method of the outside of radial, connection to male part material and a female member can be checked visually and tactile. For this reason, about the cylindrical section having been extruded from housing by the method of the outside of radial, even if it is a case so that it may be hard to check visually, it becomes possible to check tactile with a finger etc.

[0013] The cylindrical section which functions as a check member jumps out of housing, and they seem and not to separate, after the connector and retainer of this invention make male part material connect with a female member. For this reason, the activity which gathers and collects the check members which separated and fell from housing after connection becomes unnecessary.

[0014]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained concretely, referring to a drawing.

(Operation gestalt 1) The interior of the connector of this operation gestalt shown in drawing 1 - drawing 4 is carried out to the tubed male part material 1, the approximately cylindrical female member 2 to which the end of the hose (hose, such as rubber or a resin tube) which is not illustrated is fixed, and the female member 3, and it consists of retainers 3 for making the male part material 1 inserted into the female member 2 connect with the female member 2.

[0015] The male part material 1 consists of a pipe made of metal or resin, and as shown in drawing 4 , it has insertion edge 1c equipped with ring-like projected part 1a prepared so that it might project in the centrifugal direction in predetermined distance partition ****** from a tip, and point 1b located in a tip side from this ring-like projected part 1a. the female member 2 is a product made of resin (nylon), and as shown in drawing 1 and drawing 2 , it consists of housing 21 and a hose connection edge 22 prepared in same axle at the housing [which was prepared in the shaft-orientations end side (drawing 1 and the right-hand side of drawing 2 , and the following -- the same)] 21, and shaft-orientations other end side (drawing 1 and the left-hand side of drawing 2 , and the following -- the same). And housing 21 consists of major diameter 21a prepared in the shape of the same axle sequentially from the shaft-orientations end side, medium diameter portion 21b, and narrow diameter portion 21c, and it has 21d of insertion opening edges where the above-mentioned insertion edge 1c of the above-mentioned male part material 1 is inserted at the edge by the side of a shaft-orientations end. Moreover, housing 21 and the hose connection edge 22 have axial hole 22a in inner skin, and three steps 22b, 22b, and 22b for regulating the omission of a hose are formed in the peripheral face of the hose connection edge 22.

[0016] The window parts 23 and 23 of the pair penetrated to radial separate regular intervals to the peripheral wall which forms axial hole 22a of housing 21, and are countered and prepared [at above-mentioned major diameter 21a] in the hoop direction. Moreover, two seal members 24 and 24 of the shape of a ring which carries out the seal of the peripheral face of the above-mentioned point 1b of the above-mentioned insertion edge 1c inserted in the above-mentioned housing 21 are stored in the inner skin of the above-mentioned medium diameter portion 21b. Let inner skin of the above-mentioned narrow diameter portion 21c be the peripheral face of the above-mentioned point 1b of the above-mentioned insertion edge 1c inserted in the above-mentioned housing 21, and the fitting inner skin of the shape of a ring which fits in.

[0017] The above-mentioned retainer 3 consists of a member made of resin (nylon) in which elastic deformation is possible, and insertion maintenance is carried out into major diameter 21a of the above-mentioned housing 21. The abbreviation horseshoe parts 32 and 32 of the pair which projects, respectively so that phase opposite may be carried out from the annular color section 31 and this annular color section 31, as a retainer 3 is shown in drawing 4 , So that it may incline from each abbreviation horseshoe parts 32 and 32 in the method of the inside of radial to an axis, respectively A projection, Elastic deformation is possible to radial and it has the claw parts 33 and 33 of the pair arranged so that the variation rate to the method of the outside of radial may be permitted by part for the end flank of the above-mentioned window parts 23 and 23, and the flanges 34 and 34 which extend from the tip of the abbreviation horseshoe parts 32 and 32 to the method of the outside of radial. And the inclination insides 33a and 33a which inclined in the method of the inside of radial as ring-like projected part 1a carried out the press slide contact of each claw parts 33 and 33 at the time of insertion of the male part material 1, and it went to the shaft-orientations other end so that it could carry out entering a snap, The engagement edges 33b and 33b which engage with ring-like projected part 1a when ring-like projected part 1a enters a snap and the male part material 1 and the female member 2 are connected, When hydrostatic pressure acts, it has the end sides 23a and 23a of window parts 23 and 23, and the stop steps 33c and 33c as the stop section to stop, respectively so that the male part material 1 may not separate from the female member 2.

[0018] Moreover, while a retainer 3 is formed at the arms 35 and 35 of the pair which was formed in the external surface of each claw parts 33 and 33 in one and in which elastic deformation is possible, and the tip of each arms 35 and 35 in one It has the cylindrical sections 36 and 36 of the pair which installed in radial in the location which is in agreement with ring-like projected part 1a of the male part material 1 and shaft orientations at the time of connection to the female member 2 and the male part material 1, and was inserted in a part for the other end flank of each window parts 23 and 23. Let the edges by the side of the shaft-orientations end of the points 36a and 36a of each cylindrical sections 36 and 36 be inclined planes 36b and 36b so that the cylindrical sections 36 and 36 may tend to be extruded by the method of the outside of radial by the slide contact to ring-like projected part 1a of the male part material 1 inserted into housing 21. In addition, the retainer 3 is held possible [relative displacement] to housing 21 at shaft orientations in consideration of the ease of carrying out of insertion into housing 21.

[0019] In the connector of this operation gestalt, in the condition before making the male part material 1 connect with the female member 2, a retainer 3 is inserted into housing 21 and held from the shaft-orientations end side of the female member 2. At this time, each claw parts 33 and 33 of a retainer 3 are arranged so that the variation rate to the method of the outside of radial may be permitted by part for the end flank of each window parts 23 and 23 of housing 21. Moreover, the cylindrical sections 36 and 36 of a retainer 33 are installed in radial in the location which is in agreement with ring-like projected part 1a of the male part material 1 and shaft orientations at the time of connection to the male part material 1 and the female member 2, and are inserted in a part for the other end flank of the window parts 23 and 23 of housing 21. Moreover, in this condition, the points 36a and 36a of the cylindrical sections 36 and 36 of a retainer 3 are located in the locus of ring-like projected part 1a at the time of insertion of the male part material 1.

[0020] And if insertion edge 1c of the male part material 1 is inserted into axial hole 22a from the shaft-orientations end of the female member 2, by carrying out the press slide contact of the inclination insides 33a and 33a of each claw parts 33 and 33 of a retainer 3, ring-like projected part 1a of the male part material 1 will resist the elasticity, will extend claw parts 33 and 33 to the method of the outside of radial, and will pass claw parts 33 and 33. Thereby, claw parts 33 and 33 carry out an elastic return at the method of the inside of radial, the engagement edges 33b and 33b of claw parts 33 and 33 and ring-like projected part 1a stop them, and the male part material 1 and the female member 2 are made into a connection condition through a retainer 3. In addition, when a fluid circulates the inside of the female member 1 and the male part material 2 in this condition, hydrostatic pressure acts, and the stop steps 33c and 33c of the claw parts 33 and 33 of a retainer 3 stop to the end sides 23a and 23a of window parts 23 and 23, it is regulated certainly that the male part material 1 and a retainer 3 separate in shaft orientations from the female member 2.

[0021] In the time of the completion of insertion of this male part material 1 (at the time of connection to the male part material 1 and the female member 2) The points 36a and 36a of each above-mentioned cylindrical sections 36 and 36 located in the locus of ring-like projected part 1a of the male part material 1 are pressed by this ring-like projected part 1a. It moves to the method of the outside of radial through the elastic deformation of the arms 35 and 35 of a retainer 3, and these cylindrical sections 36 and 36 are extruded from housing 21 by the method of the outside of radial through a part for the other end flank of the window parts 23 and 23 of housing 21 (refer to drawing 2). Thus, when the cylindrical sections 36 and 36 of a retainer 3 are extruded from housing 21 by the method of the outside of radial, connection to the male part material 1 and the female member 2 can be checked visually and tactile. For this reason, about the cylindrical sections 36 and 36 having been extruded from housing 21 by the method of the outside of radial, even if it is a case so that it may be hard to check visually, it becomes possible to check tactile with a finger etc.

[0022] The cylindrical sections 36 and 36 which function as a check member seem and not to jump out and separate from housing in the connector of this operation gestalt, after making the male part material 1 connect with the female member 2. For this reason, the activity which gathers and collects the check members which separated and fell from housing 21 after connection becomes unnecessary. Therefore, the connector of this operation gestalt becomes able [gathering and collecting a part which is troubled if a check member separates and it falls, and the check members which separated and fell] to apply to a difficult part etc.

[0023] In addition, although the above-mentioned operation gestalt explained the example which forms an arm 35 and the cylindrical section 36 in the external surface of a claw part 33 in one in the retainer 3, it is not limited to especially this configuration. For example, it is also possible to form an arm 35 in the annular color section 31 of a retainer 3 in one, and to form the cylindrical section 36 in the point of this arm 35 in one. Also with the number of an arm 35 and the cylindrical sections 36, it is also one piece at a time, respectively.

[0024]

[Effect of the Invention] Since the cylindrical section which functions as a check member will be extruded from housing in the connector and retainer of this invention by the method of the outside of radial if male part material and a female member are connected as explained in full detail above, connection to male part material and a female member can be checked visually and tactile. For this reason, about the cylindrical section having been extruded from housing by the method of the outside of radial, even if it is a case so that it may be hard to check visually, it becomes possible to check tactile with a finger etc.

[0025] Moreover, since the cylindrical section which functions as a check member jumps out and does not separate from housing after making male part material connect with a female member, the activity which gathers and collects the check members which separated and fell from housing after connection becomes unnecessary. Therefore, the connector and retainer of this invention become able [gathering and collecting a part which is troubled if a check member separates and it falls, and the check members which separated and fell] to apply to a difficult part etc.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the sectional view showing a female member and a retainer before starting the connector of an operation gestalt and inserting male part material in a female member.
[Drawing 2] It is the sectional view in which starting the connector of an operation gestalt and showing the time of the completion of insertion of male part material.
[Drawing 3] The connector of an operation gestalt is started and it is the perspective view of a retainer.
[Drawing 4] The connector of an operation gestalt is started and it is the side elevation of male part material.
[Drawing 5] It is the sectional view in which starting the conventional connector and showing the time of the completion of insertion of male part material.
[Drawing 6] The conventional connector is started and it is the E-E line view sectional view of drawing 5 .
[Description of Notations]
1: Male part material, a 1a:ring-like projected part, a 1c:insertion edge, 2:female member, 21:housing, 23:window part, 3:retainer, 33:claw part, a 33a:inclination inside, a 33b:stop edge, 33c : the stop step as the stop section
35: An arm, 36 : cylindrical section

[Translation done.]

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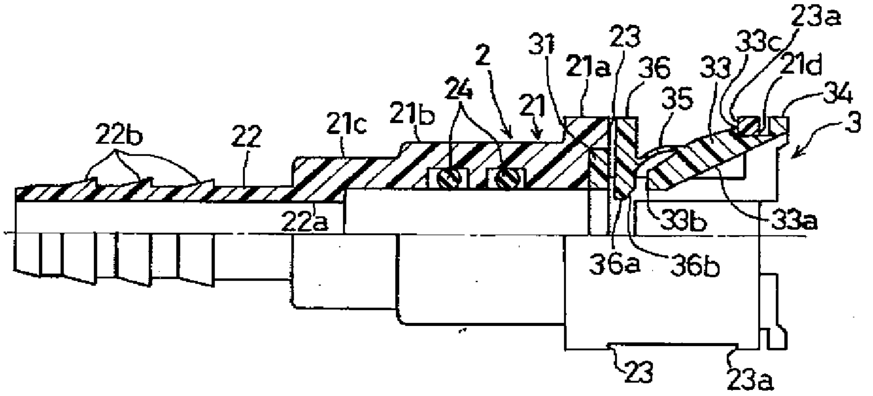
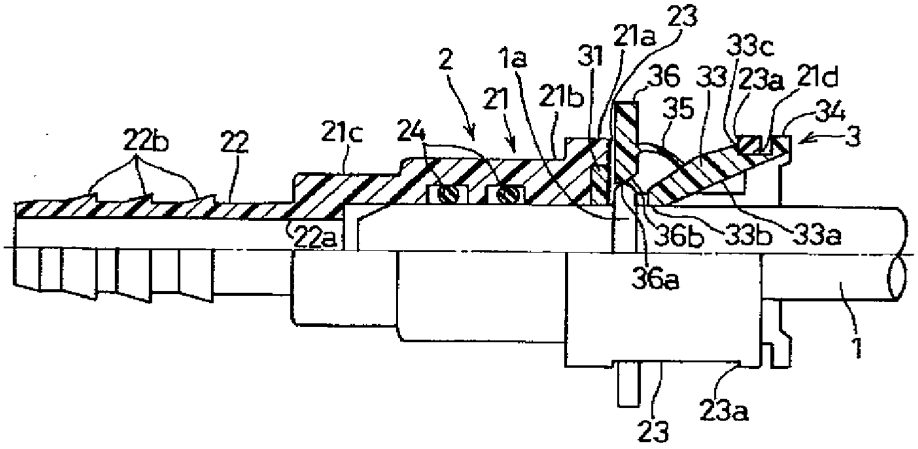
DRAWINGS

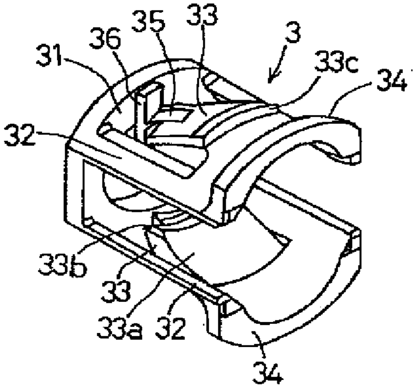
[Drawing 1]



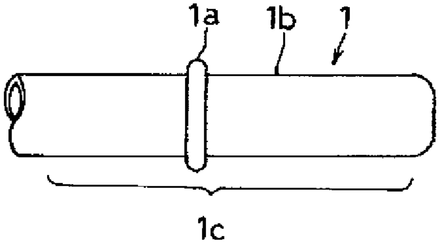
[Drawing 2]



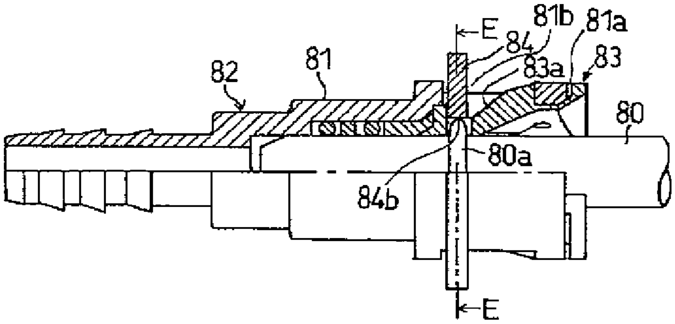
[Drawing 3]



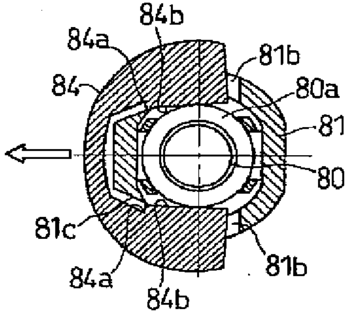
[Drawing 4]



[Drawing 5]



[Drawing 6]



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